# REMARKS

## THE CLAIM AMENDMENTS

Applicant has withdrawn claims 19-23 and added new claims 24 and 25. Following entry of this amendment, claims 18 and 24-25 will be pending.

Applicant has amended claim 18 to improve its form. Support for this amendment can be found, for example, at page 32, lines 8-16 of the application as filed.

Support for new claim 24 can be found, for example, at page 67, lines 8-20 of the application as filed. Support for new claim 25 can be found, for example, at page 7, lines 7-13, and in Example 3A beginning at page 61 of the application as filed.

None of the amendments introduces any new matter. Applicant respectfully requests entry of the amendments.

## THE ELECTION/RESTRICTION

The Examiner contends that claims 19-23 are directed to a non-elected invention. Applicant has withdrawn claims 19-23 as indicated by the Examiner.

## THE REJECTIONS
### 35 U.S.C. § 101

The Examiner has rejected claim 18 under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter. The Examiner asserts that claim 18 is drawn to the mathematical model of a classification tree, which is a form of data, and does not fall within any of the statutory classes of a process, machine, manufacture, or composition of matter.

Applicant has amended claim 18 to recite: "A computer-based system incorporating a classification tree model which incorporates Bayesian analysis for the statistical prediction of binary outcomes, wherein the tree model comprises one or more nodes representing metagenes predictive of lymph node metastasis, and one or more nodes representing clinical risk factors." Such an amendment is believed to obviate the Examiner's rejection since the amended claim is directed to a

machine and, therefore, constitutes a statutory subject matter. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

## 35 U.S.C. § 103(a)

The Examiner has rejected claim 18 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Buntine (Statistics and Computing 2:63-73 (1992) ("Buntine")) in view of Veer et al. (Nature, 415: 530-536 (2002) ("Veer")). Buntine teaches general classification tree model with Bayesian analysis of biological data for the prediction of binary outcomes, such as diseased states. Veer teaches using data that represent the expression patterns of a set of genes (metagenes) predictive of lymph node metastasis in a classification scheme to predict clinical outcomes. The Examiner asserts that it would have been obvious to one of ordinary skill in the art to substitute the metagenes of Veer et al. as the biological data in Buntine's classification tree model. Applicant respectfully traverses this rejection.

Pursuant to MPEP 2142, "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants' disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)." Applicant submits that the cited references, alone or in combination, fail to meet all three basic criteria.

Applicant respectfully submits that nothing in the combination of Buntine and Veer renders obvious the claims of the instant application. Buntine discloses learning classification trees generically and provides one example (thyroid) of a decision tree in the context of a medical application. Buntine, however, discloses that "more research is needed on these Bayesian models" and that it is unknown how various factors contribute to the prediction accuracy. Veer discloses the use of DNA microarray analysis on primary breast tumors and supervised classification to identify a gene expression signature predictive of metastases.

Applicant reminds the Examiner of claim 18, which recites: "A computer-based system incorporating a classification tree model which incorporates Bayesian analysis for the statistical prediction of binary outcomes, wherein the tree model comprises one or more nodes representing metagenes predictive of lymph node metastasis, and one or more nodes representing clinical risk factors" and points out a critical element of this claim. As an initial matter, the currently claimed tree model system includes, in part, one or more nodes that represent a set of genes that are predictive of lymph node metastasis **and** one or more nodes representing clinical risk factors, e.g., patient's age or tumor size. This is in clear contrast to the method of Veer, which teaches a predictive model solely based on the expression pattern of a set of genes using microarray analysis as described above. Applicant respectfully submits that nothing in either Buntine or Veer would have motivated one skilled in the art at the time the instant application was filed to combine a Bayesian analysis model with the expression pattern of a set of predictive genes for lymph node metastasis **and** clinical risk factors specific to the patient. Further, the skilled practitioner would not have had any reasonable expectation of success because the teachings of Buntine specifically disclose that factors contributing to prediction accuracy are unclear. Accordingly, Applicant respectfully requests that the Examiner withdraw this rejection.
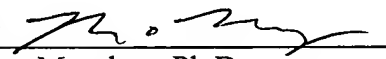
**Co-pending applications**

Applicants take this opportunity to make the Examiner aware of the existence of co-pending application number 10/291,878. Applicants note that prosecution is on-going in co-pending application number 10/291,878, and the most recent action is a Final Office Action mailed December 13, 2007.

## CONCLUSION

In view of the foregoing remarks and amendments, Applicant requests that the Examiner favorably reconsider this application and allow the amended claims pending therein. Should the Examiner feel that a telephone conference with the Applicant's representatives would assist the Examiner, he is invited to telephone the undersigned at any time.

Dated: December 28, 2007                    Respectfully submitted,

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